REMARKS

Claims 1, 11, and 20 are objected to for minor informalities and/or defects. Specifically, the Office Action alleges that "[c]laim 1 recites the subject matters that the recited wire is coated and in contact with Ti along at least one surface and with titanium oxide along at least three surfaces." Thus, the Office Action alleges that apparently claim 1 "fails to clarify how many such covered surfaces the recited wire has."

Applicants are unaware of any section of the M.P.E.P. that specifically requires that the exact number of sides/surfaces of the claimed wire must be recited. Accordingly, absent any specific requirement by the M.P.E.P., or under either of 35 U.S.C. or 37 C.F.R., Applicants respectfully request that the objection to claims 1, 11, and 20 be withdrawn. If the Examiner maintains the objection to claims 1, 11, and 20, Applicants respectfully request specific citation of any of the M.P.E.P., Title 35 of the United States Code, or Title 37 of the Code of Federal Regulations that would specifically require that claim 1 must recite "how many such covered surfaces the recited wire has."

While Applicants do not acquiescence to the Examiner's objection to claim 1, they amend claim 1 to recite "a wire...contacted along the remaining three side surfaces by a second coating film made of titanium oxide." Thus, all objections to the claim should be withdrawn.

Claims 1, 11, and 20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Batey et al. (US 5,831,283) in view of Masaki et al. (JP 10-153788). The rejection is traversed as being based upon a combination of references that neither teaches nor suggests the novel combination of features recited in independent claim 1, and hence, dependent claims 11 and 20.

The Office Action relies upon Batey et al. for allegedly teaching a gate electrode "comprising a Cu layer contacted along a bottom side surface with a Ti coating." However, the Office Action admits that "Batey does not expressly disclose that the other three side surfaces of the wire can be covered with a titanium coating." In addition, the Office Action alleges that "one of ordinary skill in the art would readily recognize that titanium oxide is an art-recognized common coating material for a gate electrode line for its better protection. For support for this allegation, the Office Action relies upon Masaki et al. "(see its DERWENT BASIC-ABSTRACT, and also see Figs. 2 and 5A), wherein the wire is coated and in contact with a metal oxide layer (21a or 33b) along the three upper side surfaces, and the metal oxide can be titanium." As a result, the Office Action alleges that "it would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the titanium oxide upper surface coating of Masaki into the TFT LCD of Batey, so that a TFT LCD with improved protection to the gate electrode line would be obtained." Applicants respectfully disagree.

Initially, Applicants respectfully submit that Batey et al. actually teaches away from providing a copper conductive line with an underlying titanium layer. For example, Batey et al. teaches (col. 2, lines 29-36) providing a titanium adhesion layer between a copper line and a glass substrate to increase adhesion "does not address the main problem of reactivity and delamination when silicon dioxide or a conventional silicon nitride film is used over the copper to fabricate the gate insulator of the TFT." Thus, Applicants respectfully assert that Batey et al. actually teaches away from using a titanium underlayer for the copper line.

In addition, Applicants respectfully submit that Batey et al. teaches (col. 5, lines 16-57) using an ammonia-free silicon nitride layer 26 formed over a copper gate line 22 in order to

passivate the copper gate line 22 from subsequently-formed gate insulator materials. Thus, Applicants respectfully submit that the direct interface between the ammonia-free silicon nitride layer 26 and the copper gate line 22 is critical to the function of Batey et al.

In contrast to Batey et al., Applicants respectfully assert that Masaki et al. teaches (paragraph [0026], as provided in the JPO's partial English-language translation of Masaki et al. provided in Applicants' Response filed on October 9, 2003) the disadvantages of providing an alloy film 32 having a TiOx film 33a and TiNx film 35, wherein a crack 34 may be formed due to stress generated between the alloy film 32 and the underlying glass substrate 31. Accordingly, Applicants respectfully assert that Masaki et al. actually teaches the unsatisfactory effects of forming different materials on an alloy film.

In contrast to the alleged motivation to combine Batey et al. and Masaki et al., as set forth by the Office Action, Applicants respectfully submit that "to incorporate the titanium oxide upper surface coating of Masaki into the TFT LCD of Batey" would, in fact, render Batey et al. unsatisfactory for its intended purpose, i.e., passivate the copper gate line 22 of Batey et al. from subsequently-formed gate insulator materials. Furthermore, Applicants respectfully assert that Masaki et al. provides no teaching *whatsoever* for substituting the ammonia-free silicon nitride layer 26 of Batey et al. with titanium oxide.

MPEP § 2143.02 instructs "[i]f proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no motivation to make the proposed modifications. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)." Accordingly, Applicants respectfully assert that combining the teachings of Masaki et al. and Batey et al. would render the function of Batey et al. unsatisfactory for its intended

purpose since Batey et al. requires that the ammonia-free silicon nitride layer be in direct contact with the copper line. Furthermore, Applicants respectfully assert that since Masaki et al. actually teaches the unsatisfactory effects associated with forming different electrically insulating materials on an alloy film, combining the teachings of Masaki et al. and Batey et al. would actually result in formation of stress between the alloy film and the underlying substrate, thereby forming cracks in the electrically insulating material.

In addition, Applicants respectfully rebut the Office Action's allegation that "titanium oxide is an art-recognized common coating material for a gate electrode line for its better protection, as evidenced in Masaki." Nowhere in Masaki et al., or any other prior art of record, is there any distinct teaching or suggestion that titanium oxide is "an art recognized common coating material." Moreover, Applicants respectfully submit that none of the prior art of record provides proper motivation to combine the teachings of Masaki et al. and Batey et al. Thus, Applicants respectfully assert that there exists no proper motivation to combine the teachings of Masaki et al. and Batey et al. to arrive at Applicants' claimed invention.

As instructed by MPEP § 2143.01, [t]he mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990)." Thus, since neither Masaki et al. nor any other art of record teaches or suggests the desirability to substitute the ammonia-free silicon nitride layer of Batey et al. with titanium oxide, the Office Action fails to establish a *prima facie* case of obviousness with respect to at least independent claim 1, and hence dependent claims 11 and 20.

For at least the above reasons, Applicants respectfully submit that claims 1, 11, and 20 are neither taught nor suggested by any of the applied prior art references, whether taken alone or in combination. Applicants respectfully assert that the rejection under 35 U.S.C. § 103(a) should be withdrawn because the above-discussed novel combinations of features are neither taught nor suggested by any of the applies references, whether taken alone or in combination.

CONCLUSION

In view of the foregoing, Applicants respectfully request reconsideration and reexamination of the application and timely allowance of the pending claims. Should the Examiner feel that there are any issues outstanding after consideration of the response, the Examiner is invited to contact the undersigned to expedite prosecution.

If there are any other fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-0310. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such as an extension is requested and the fee should also be charged to our Deposit Account.

Respectfully submitted,

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